

1 witness to state our position.

2 JUDGE MILLER: I think I
3 understand the point being argued here in so
4 far as it relates to differing interpretations
5 of what the Act is going to require. I think
6 that last question did go beyond the scope of
7 the witness's testimony, so I would ask you to
8 withdraw it.

9 MR. CANIS: I certainly would,
10 your Honor.

11 Q. Mr. Whiting, are you familiar with ring down
12 circuits?

13 A. No.

14 JUDGE MILLER: What kind of
15 circuits?

16 MR. CANIS: Ring down, R-I-N-G
17 D-O-W-N.

18 JUDGE MILLER: Thank you.

19 Q. Are you familiar with hot line or warm line
20 circuits?

21 A. No. I think this is before my time in the
22 industry.

23 Q. Are you familiar with a technology that would
24 allow me to take a phone on my desk and if I
25 were constantly calling Joe next door, I could

1 program my phone or my switch or whatever so
2 that as soon as I pick up the phone I get an
3 automatic ring to that individual?

4 A. No, I'm not familiar with that technology.
5 Again, I'm here -- I know frame relay and
6 that's what I'm here to talk to you about.

7 Q. But you're talking about connection-oriented
8 services, aren't you?

9 A. Frame relay as a connection-oriented service,
10 yes.

11 Q. So you're wholly ignorant of other
12 connection-oriented services?

13 A. I can probably, you know, talk through
14 conceptually the service you described. I
15 really am ignorant as to the technical
16 capabilities that enable that.

17 Q. Let me put it this way. Let me put it more
18 generically. If I took a switched telephony
19 service, I picked up my office phone and have
20 the switch programmed so that if I put in, say,
21 a two- or three-digit code it would
22 automatically ring to one number at an address
23 across the street, would that be a
24 connection-oriented service?

25 A. I think that depends.

1 Q. On what?

2 A. I think there are certain ways to route that

3 over a connection-oriented service such as

4 frame relay. There's ways probably to program

5 that, although I'm unsure of the technological

6 side, over the public switched telephone

7 network.

8 Q. Let's explore that a little bit. Let's suppose

9 the entire call did not transit beyond the

10 public switched network. If I programmed a

11 switch that every time I picked up a phone or

12 dialed a three-digit extension it only went to

13 one place, would that be a connection-oriented

14 service?

15 A. Again, I don't know. It could be I guess.

16 Q. Is Internet access a connection-oriented

17 service?

18 A. The access to Internet probably could be -- you

19 probably could achieve Internet access over a

20 connection-oriented service such as frame

21 relay.

22 Q. How about dial access to an Internet service

23 provider?

24 MR. FRUEHWALD: Your Honor, I

25 think we're getting far afield from the direct

1 testimony here in terms of exploring other
2 types of sometimes hypothetical and other
3 technologies beyond what's at issue here, frame
4 relay, which is what Mr. Whiting's testimony
5 was about, and so I'm going to object to this
6 as being beyond the scope of cross and being
7 outside the province of this arbitration
8 altogether. We're not talking about the other
9 technology.

10 MR. CANIS: May I respond, your
11 Honor? The purpose of this line of questions
12 is to identify the ramifications if this
13 Commission were to adopt the definitional
14 interpretation of exchange service that is
15 being promoted by Ameritech in this proceeding,
16 and I think it is important both as a factual
17 issue and as a policy issue to determine if
18 this Commission adopts the interpretation of
19 exchange service as a switched service and only
20 a switched service, would that exclude
21 significant other categories of traffic besides
22 frame relay from interconnection under 251, 252
23 of the Act.

24 JUDGE MILLER: Well, I understand
25 your point. Of course, I think the witness is

1 here to explain his definition of
2 connection-oriented and how that relates to
3 frame relay. Now, I do think it is appropriate
4 to explore what is meant by connection-oriented
5 testimony and it's appropriate to inquire as to
6 other examples such as Internet access;
7 however, you're not here as an Internet access
8 witness and to the extent that that is beyond
9 the scope of your knowledge, you certainly do
10 not have to answer those questions, but it is
11 appropriate to probe what -- how you define a
12 connection-oriented technology and how you
13 distinguish that from a switched technology.

14 MR. FRUEHWALD: Your Honor, let
15 me respond. We haven't had a second hearing on
16 whether these other technologies are
17 appropriate and the assumption is that other
18 ones are not, and we're not going to go, I take
19 it, and litigate all the other types of
20 technology to see whether they're comparable.
21 We're here on frame relay.

22 Second, this is not the position of
23 Ameritech that's being represented here. It's
24 not a matter of switched. It's exchange. It's
25 the key terminology which we're talking about

1 which makes this different from frame relay
2 service, not the fact that it's switched but
3 the fact that it's not an exchange, and that's
4 the key we briefed and that the parties should
5 know about and this is sort of a whole
6 sidelight which is not critical to the position
7 that we've taken, although it's -- you know,
8 it's a part of the description of the service,
9 that's a misrepresentation of what we're
10 asserting in terms of the statutory
11 interpretation or the key concept of exchange.

12 JUDGE MILLER: Well, I appreciate
13 the clarification to the extent there had been
14 a blending of the concepts of switched and
15 exchange. I do think that ICI may probe the
16 witness as to his conceptualization of
17 connection-oriented versus switched as in his
18 testimony and you're free to clarify the
19 relationship, how switched and exchange are
20 similar and perhaps how they are different.

21 Also, I want to assure Ameritech that
22 other technologies which are mentioned, it is
23 not assumed that those are necessarily covered
24 by the Act. Nevertheless, again, ICI is free
25 to compare it to other existing technologies

1 without predetermining any ruling by this
2 Commission or anyone else as to the
3 requirements for interconnection for such
4 services under the Act, so if you want to -- I
5 don't know where that leaves us as far as the
6 question on the table, but I'd ask you to
7 repeat it, not necessarily verbatim, but if you
8 can, that would be fine.

9 QUESTIONS BY MR. CANIS:

10 Q. Thank you. In the example I discussed earlier
11 where I have a public switched network phone, I
12 pick it up and either automatically or after
13 dialing two or three digits my call is routed
14 entirely over the public switched network to
15 arrive at a single predefined destination,
16 would that be a connection-oriented service?

17 A. Well, again, the terms are confusing me a
18 little bit. When I think of a public switched
19 network phone, I think of a phone that accesses
20 the public switched network, so you would not
21 have that inherent ability to just dial a
22 couple numbers and get to another point. Maybe
23 I am not familiar with the technology well
24 enough.

25 Q. Well, I think we discussed earlier that ATM

1 technology may take service originated on the
2 public switched network and transfer it to a
3 private intrabuilding ATM network; is that not
4 the case?

5 A. Well, intracompany is probably more accurate.
6 I think there certainly will be ways to
7 interface the public switched telephone network
8 with a private data network.

9 Q. So is it your testimony that there cannot be a
10 connection-oriented service that exists on the
11 public switched network?

12 A. Again, we get down to some semantics. When you
13 say exists on the public switched telephone
14 network, I'm a little unclear what you're
15 getting --

16 Q. Let's take originates, is transited over and
17 terminates on the public switched network.

18 A. Again, my interpretation of the public switched
19 telephone network is something distinct from a
20 connection-oriented network.

21 Q. So it is your testimony, then, that you cannot
22 have a connection-oriented application or
23 transmission on the public switched network?

24 A. Yes.

25 Q. Are there any switched data services?

1 A. Well, again, we have to differentiate between a
2 switching technology and a data service which
3 is in fact switched. Frame relay is a
4 switching technology, but again I would
5 reinforce that it's not in fact switched as you
6 would think of when you think of the public
7 switched telephone network.

8 Q. Are there any other data services that are
9 switched services?

10 A. Yes.

11 Q. Could you name some, please?

12 A. One that I know of is switch multi-megabyte
13 data service.

14 Q. What is the characteristic that makes that data
15 service a switched data service?

16 A. Well, the connections aren't permanent. It's
17 not connection-oriented such as frame relay. A
18 user on a switch multi-megabyte network can
19 dial up any other user using the same type
20 phone number, the E.164 numbering plan, and
21 then disconnect that call as soon as they're
22 done. They can even call people outside of the
23 network that have made allowances to accept an
24 incoming call from this technology.

25 Q. Let's explore that last statement a little.

1 You said that SMDS users have dial-up access to
2 any other SMDS user. Does that -- I'm sorry?

3 A. I didn't say --

4 Q. I'm sorry.

5 A. If allowances are made, they can have that
6 connectivity. It's not just the general rule
7 that you can dial up anyone else.

8 Q. So you're saying -- what was your term,
9 allowances must be made?

10 A. Well, let me give you an example. Say a auto
11 supplier such as Ford might allow their
12 suppliers to access their internal corporate
13 network via SMDS by allowing them security
14 clearance, passwords, authentication,
15 et cetera, to be able to dial in. Another user
16 would not have that same capability. Ford
17 would have to make allowances.

18 Q. So if I'm an SMDS user, I don't have ubiquitous
19 dial-up access to every other telephone
20 communication subscriber in the exchange, is
21 that the case?

22 A. That's correct. I would not categorize SMDS as
23 an exchange service.

24 Q. But you would characterize it as a switched
25 service?

1 A. Switching technology connectionless. Again,
2 switching technology, both frame, ATM and SMDS,
3 are all based on switching technologies, but
4 again it's the concept of connection-oriented
5 versus connectionless. SMDS is connectionless.
6 Frame relay is connection-oriented.

7 Q. Could you explain that, please?

8 A. SMDS is not built upon those permanent virtual
9 connections like frame is. Again, you can dial
10 up and use the data services as long as you
11 need it, then tear down that call and call up
12 another user.

13 Q. Are there any applications of frame relay that
14 would allow you to do that?

15 A. There has been talk of switched virtual
16 circuits with frame relay which would enable
17 something similar, but as of today Ameritech
18 hasn't implemented that and I'm not sure of any
19 customers that have either. I'm not aware of
20 any customers.

21 Q. You are a member of the -- I may have this
22 wrong, but I think it's Frame Relay Standards
23 Board?

24 A. Frame Relay Forum. It's more of a consortium,
25 not a board.

1 Q. Are you aware of any developments toward
2 switched virtual circuits coming out of work
3 that the forum has done?

4 A. Yes, there has been a lot of attention paid to
5 switched virtual circuits. There may be
6 standards that are put in place by the
7 equipment vendors. I'm not sure of the most
8 current status.

9 Q. So is it your position that frame relay may not
10 be -- rather is a connection-oriented service
11 now, but may be a switched service at some time
12 in the future?

13 A. Sure, yes.

14 Q. About how far in the future?

15 A. I'm not sure. Although the standards might be
16 put in place, there are some severe obstacles
17 to implementation of switched virtual circuits
18 such as the carriers' abilities to accurately
19 track and bill for these technologies.

20 Q. Let's go back to the description of the SMDS
21 services. You mentioned I'm Ford and I have a
22 number of parts dealers that I want to have
23 hooked up on to my SMDS network. How is that
24 done?

25 A. From what perspective?

1 Q. I'm calling AT&T, I'm Ford. Let's say I heard
2 you got this hot new SMDS network. I want to
3 set one up. Tell me what I need to do to get
4 dealers X, Y and Z on my network.

5 A. Okay. Well, AT&T will probably refer Ford to
6 MCI because MCI is the only interexchange
7 carrier I'm aware of that offers SMDS.
8 Actually they'll probably tell them it's not
9 around any more because they don't want to send
10 MCI any customers.

11 Basically the customer would define their
12 locations, define who they would want to
13 communicate with and then a carrier such as MCI
14 would make recommendations on the proper
15 equipment, help them set up and make those
16 allowances I refer to to make sure each
17 location could communicate with the other.

18 Q. Now, if I wanted to do the same thing on a
19 frame relay network and I call up Ameritech and
20 I say I understand you've got a hot new frame
21 relay network, I want to be on it and I want to
22 get my suppliers X, Y and Z on it, how would I
23 go about doing that?

24 A. Much in the same manner. However, I am not
25 aware of any customers that have allowed

1 suppliers to access their network over frame
2 relay. SMDS has some inherent security
3 capabilities in it that enable outside users to
4 access the network. Frame relay does not.

5 Q. Now, when I identify either under SMDS or frame
6 relay the off-the-network parties that I want
7 to have included on my network, technically
8 what happens? Do I have to get their addresses
9 or something that identifies where they are
10 inserted into a routing matrix?

11 A. Again, I guess I can speculate. I don't know
12 of anyone who has ever done this. If a company
13 were to allow an outside company access to
14 their critical data network, there would have
15 to be provisions put in each router, which is
16 the premises equipment which, you know, routes
17 traffic from each customer LAN to another
18 location's LAN, there would have to be
19 provisions put in there to identify the outside
20 supplier's location and vice versa.

21 Q. For both SMDS and frame relay?

22 A. Yes.

23 Q. Yet one is a connection-oriented service and
24 one is not?

25 A. Yes.

1 Q. And could you explain a little bit why not?

2 A. Well, again, the connections on frame relay are
3 permanent, they're premapped. The connections
4 on SMDS are dynamic, they could be set up and
5 torn down, more similar I guess to the public
6 switched telephone network.

7 Q. What, then, is the definition of a
8 connection-oriented service?

9 A. Connection-oriented service, my definition
10 would be a permanent connection where the data
11 follows the same path across the network.
12 Connectionless, if you would like me to define
13 that.

14 Q. Thank you.

15 A. Yes. This is the second time we've been
16 through this, anticipating now.
17 Connectionless, the data would not necessarily
18 follow the same path across the network.

19 Q. Are you using connectionless interchangeably
20 with the term switched?

21 A. No. That's the differentiation I tried to
22 make. Both are switching technologies, one is
23 connection-oriented, frame relay, because of
24 its permanent paths, one is connectionless,
25 such as SMDS because you do not have the

1 permanent paths.

2 Q. Where does switching using public switched
3 network facilities enter into this, or does it?

4 A. I don't -- again, you use the term public
5 switched. Did you use telephone network or
6 just public switched network?

7 Q. Is there a difference?

8 A. In my mind, yes.

9 Q. Could you explain that, please.

10 A. Again, when I think of the public switched
11 telephone network, I think of the
12 infrastructure in place to carry switched
13 telephone calls. When we're talking about
14 these data services, they're separate data
15 networks based on switching technologies.

16 Q. So if I were to call on the public switched
17 network, would I have ubiquitous dial-up access
18 to every subscriber in a given exchange?

19 A. I would say it be extremely high, your access
20 would be extremely high.

21 Q. And if I were on -- I'm sorry.

22 A. I would assume a hundred percent. Again, I'm
23 not an expert in that area.

24 Q. Okay. And if I were on what you've defined as
25 the telephone network, would I have ubiquitous

1 dial-up access to everybody in the exchange?

2 MR. FRUEHWALD: Is that the same
3 question?

4 MR. CANIS: I'm sorry, the first
5 one I thought I asked about the public switched
6 network, not the telephone network. Let's
7 clarify that.

8 THE WITNESS: Please.

9 Q. Public switched network, we're talking about
10 public switched network now. If I am on the
11 public switched network, do I have ubiquitous
12 dial-up access to everyone in a given exchange?

13 A. Public switched telephone network or some type
14 of public switched data network where switches
15 are used for multiple customers?

16 Q. I'm sorry, I thought we just defined your
17 definition of the public switched network
18 versus the telephone network.

19 A. Again, I guess maybe I'm getting caught up in
20 the semantics.

21 Q. I think perhaps all there are are semantics
22 here. Let's define -- let's start out defining
23 our terms. What is the public switched
24 network?

25 A. A public switched network I would say is a

1 pretty generic term which is categorized where
2 carriers would use a single switching platform
3 to carry multiple customers across there.

4 The public switched telephone network is a
5 separate technical architecture and it would
6 be, you know, the classical network you think
7 of when you pick up your telephone at home and
8 make a telephone call.

9 Q. So that does not use a single switching
10 platform?

11 A. Which one?

12 Q. The telephone -- public switched telephone
13 network.

14 A. It could, it could not. You could have
15 multiple switch vendors in a public switched
16 telephone network. You could have various
17 carriers that are interconnected with the
18 public switched telephone network with a
19 variety of different switch platforms.

20 Q. So is there a difference between the PSN and
21 the PSTN in terms of a person's ability to have
22 ubiquitous dial-up access to everyone in the
23 exchange?

24 A. Yes, I think so. And, again, the public
25 switched network I think is really a generic

1 term that you would just categorize any carrier
2 that would combine multiple customers over a
3 single switching platform.

4 Q. Now, can you have a connectionless service on
5 the public switched telephone network?

6 A. Not that I'm aware of. I guess loose
7 interpretation you might -- well, no, not that
8 I'm aware of.

9 Q. So the answer is no?

10 A. Yes.

11 Q. Can you have --

12 MR. FRUEHWALD: Excuse me,
13 connectionless on the public switched telephone
14 network?

15 MR. CANIS: Telephone network.

16 MR. FRUEHWALD: Connectionless,
17 okay.

18 Q. Can you have a connection-oriented service on
19 the public switched telephone network?

20 A. Yes.

21 Q. So you can have a connection-oriented service
22 on the PSTN?

23 A. Connection-oriented on the public switched
24 telephone network?

25 Q. Right.

1 A. Yes.

2 Q. Can I have frame relay on the PSTN?

3 A. No.

4 Q. But frame relay is a connection-oriented
5 service?

6 A. Yes.

7 Q. What other connection-oriented services that
8 are not voice telephony can I have on the PSTN?

9 A. Voice telephony and I guess other
10 interpretations of that telephony are the only
11 ones I can think of. That would include modem
12 traffic and facsimile type traffic.

13 JUDGE MILLER: And those are
14 examples of connection-oriented traffic which
15 you can have on the public switched telephone
16 network?

17 THE WITNESS: Yeah, when you
18 establish a telephone call, although it's
19 switched, that actual connection -- and again
20 I'm getting into the architecture of the public
21 switched telephone network which I'm not
22 extremely familiar with, but I believe it
23 follows the same path, so I would categorize it
24 as connection-oriented.

25 Q. Now, does that mean that fax and modem

1 circuit -- I'm sorry, your Honor, were you
2 finished?

3 JUDGE MILLER: Yes, I am.

4 Q. Does that mean that fax and modem circuits on
5 the PSTN cannot be dynamically routed but they
6 have to be torn down?

7 A. They don't have to be torn down.

8 Q. Well, can they be dynamically routed?

9 A. I wouldn't call it routing. I would say that
10 you can establish connections to a variety
11 of -- any other user of the public switched
12 telephone network you can establish a
13 connection with.

14 Q. I thought a little while ago you said that
15 connection -- the definition of
16 connection-oriented was you could not
17 reconfigure it dynamically but you had to tear
18 it down if you wanted to terminate it.

19 A. Maybe more accurate would be the actual path of
20 the data. One of the categories -- one of the
21 characteristics of frame relay is those
22 connections never come down. Maybe a broader
23 interpretation of connection-oriented would be
24 the data following the same path.

25 Q. And to your knowledge, frame relay never has

1 data following the same path?

2 A. That's opposite from what I said.

3 Q. Clearly I'm confused then. Could you clarify?

4 A. Frame relay is connection-oriented.

5 Q. Uh-huh.

6 A. And in connection-oriented technology, the data
7 follows the same path.

8 Q. And does that path have to be torn down if you
9 want to terminate that circuit and reconfigure
10 it to another location?

11 A. Well, with frame relay the circuits are
12 permanent, they're never torn down, so you pay
13 for it 24 hours a day, seven days a week. So
14 if you wanted to tear -- if you wanted to
15 communicate with another location, you would
16 have another permanent connection. Doesn't
17 give you that dynamic capability such as the
18 public switched telephone network does to go to
19 any user on that network dynamically.

20 Q. But do fax and modem connection-oriented
21 circuits, are they similarly -- are they
22 similarly permanent? Can they be dynamically
23 reconfigured?

24 A. They can be both. I would say in most cases
25 when we think of fax traffic, that is a

1 call-by-call type communication where the call
2 is set up, then the data follows that path over
3 that call itself.

4 Q. I'd like to refer you to page 5 of your
5 testimony, line 17 and 18 --

6 A. Okay.

7 Q. -- where we talk about prebuilt routing tables.
8 Do switched services use prebuilt routing
9 tables?

10 A. Well, in a sense they do that when a switch
11 looks at a frame of traffic coming through, it
12 knows what direction to send it. The routing
13 table's significantly different because the
14 router actually looks inside of that frame and
15 processes that data. The switch just passes it
16 through.

17 Q. If I am a new subscriber to switched service on
18 the PSTN, can anybody call me until I have my
19 number entered into the routing table?

20 A. Again, I don't think the term routing table is
21 accurate in the public switched telephone
22 network.

23 Q. I'm sorry, what term should I be using, then?

24 A. I'm not familiar with that. I would say
25 switching table, exchange telephone number

1 table.

2 Q. Okay.

3 A. Again, I'm not an expert in the terminology
4 used there.

5 Q. Same question, then. If I'm a brand new user
6 on the PSTN, can people call me unless I have
7 my number entered into the switching table?

8 A. That's sort of a chicken and egg question.
9 Once you get dial tone, your number's going to
10 be in there. If you don't have dial tone, no
11 one will be able to reach you, so it's my
12 understanding that no, unless that connection
13 is built, no one will be able to call you.

14 Q. What's the -- you mentioned this before and I'm
15 sorry if I'm being repetitious here. What is
16 the difference between a switching table used
17 on the PSTN for voice telephony and a routing
18 table used for frame relay services?

19 A. Again, I'm not familiar with the switching
20 tables used in a public switched telephone
21 network. I do know that in a router or in a
22 routing table, the router examines the data
23 inside of the information being passed through
24 the frame or the packet, whereas in a switch
25 that does not occur.

1 Q. If I had a real big routing table that included
2 the end user locations of everyone in an
3 exchange, would I have frame relay with
4 ubiquitous dial-up access to everyone in the
5 exchange?

6 A. I wouldn't call it dial-up access. You could
7 have permanent connections, again conceivably.
8 I think it would be inconceivable that this
9 would ever be because of engineering
10 constraints, but it is conceivable that you
11 could establish permanent connections with
12 every user in an exchange if they all subscribe
13 to frame relay.

14 Q. Does that application become more credible if
15 we get into a switched frame relay mode, a
16 switched virtual circuit mode?

17 A. No, I don't think so.

18 Q. Can you explain why not?

19 A. The concept of having every inhabitant of an
20 exchange subscribing to a technology such as
21 frame relay is inconceivable.

22 Q. But currently we have every inhabitant of an
23 exchange that's on the network subscribing to
24 voice telephony, is that not the case?

25 A. I'm not clear on your -- you mean the current